RF Exposure Report

Report No.:	SABDKG-WTW-P21070273A
FCC ID:	JNZVR0030
Test Model:	VR0030
Received Date:	2021/11/10
Test Date:	2021/11/15
Issued Date:	2021/11/27
Applicant:	LOGITECH FAR EAST LTD.
Address:	7700 Gateway Boulevard Newark California United States
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SABDKG-WTW-P21070273A	Original release.	2021/11/27

1 Certificate of Conformity

Product:	RoomMate
Brand:	logitech
Test Model:	VR0030
Sample Status:	Engineering sample
Applicant:	LOGITECH FAR EAST LTD.
Test Date:	2021/11/15
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 General RF Exposure Guidance v06

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** 2021/11/27

Claire Kuan / Specialist

Approved by : _____ , **Date:** 2021/11/27

Clark Lin / Technical Manager

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	…	…	f/1500	30
1500-100,000	…	…	1.0	30

f = Frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Formula

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 20 cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Antenna No.	RF Chain No.	Brand	Model	Antenna Net Gain(dBi)	Frequency Range (GHz)	Antenna Type	Connector Type
1	Chain 0	Speed	F-0R-CC-6029-001-00	3.89 3.69 1.96 3.3 2.84	2.4~2.4835 5.15~5.25 5.25~5.35 5.47~5.725 5.725~5.850	Monopole	MHF(I-PEX)
2	Chain 1	Speed	F-0R-CC-6029-002-00	2.1 4.5 3.95 4.59 4.92	2.4~2.4835 5.15~5.25 5.25~5.35 5.47~5.725 5.725~5.850	Monopole	MHF(I-PEX)

*The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

2.5 Calculation Result of Maximum Conducted Power

The WLAN (U-NII-1, U-NII-2A, U-NII-2C, U-NII-3) and BT-LE maximum power was refer to the test report (Report No.: SABDKG-WTW-P21070273)

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Pass/Fail
WLAN 2.4GHz	2412-2462	157.228	6.05	20	0.12597	1	Pass
WLAN U-NII-1	5180 ~ 5240	150.35	7.11	20	0.15376	1	Pass
WLAN U-NII-2A	5260 ~ 5320	151.37	6.02	20	0.12044	1	Pass
WLAN U-NII-2C	5500 ~ 5580 & 5660 ~ 5720	152.08	6.98	20	0.15094	1	Pass
WLAN U-NII-3	5745 ~ 5825	282.788	6.95	20	0.27873	1	Pass
BT-LE	2402-2480	1.205	3.89	20	0.00059	1	Pass

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. WLAN 2.4GHz: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 6.05 dBi
3. WLAN 5GHz:
   U-NII-1: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 7.11 dBi
   U-NII-2A: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 6.02 dBi
   U-NII-2C: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 6.98 dBi
   U-NII-3: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 6.95 dBi

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WLAN (2.4GHz) + WLAN (5GHz) = 0.12597 / 1 + 0.27873 / 1 = 0.40470

WLAN (2.4GHz) + Bluetooth = 0.12597 / 1 + 0.00059 / 1 = 0.12656

WLAN (5GHz) + Bluetooth = 0.27873 / 1 + 0.00059 / 1 = 0.27932

Therefore the maximum calculations of above situations are less than the "1" limit.

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